2.3 SIGNATURES EO

There are several considerations relevant to the determination of the probability that an aircraft will be detected visually. Only target aircraft within a sector being searched are considered for detection. The masking of targets by the structure of the searching aircraft around the cockpit (user defined) can render the target undetectable. Finally, if layered cloud cover intervenes between the observer and target, no detection is possible unless the distance between observer and target is less that 2000 ft.

Threshold Contrast

Provided the above constraints are met, pilot visual acuity is established as a contrast threshold. This parameter defines acuity in terms of minutes of an arc, the value being the smallest discernible object which a pilot can see.

Probability of Detection Calculation

The solid angle model calculates a probability of detection based on the apparent size of the target as defined by the solid angle subtending its projected area (which depends on target size, orientation, and range), and on pilot visual acuity. Input data for Brawler is currently defined so that a target, whose presented area equals that of a typical U.S. fighter, will have probability of detection of 0.5 at a range of approximately 3nm.

Once a target has been observed visually, it will continue to be observed with a probability of 1.0 as long as it is not masked and the ratio of solid angle to the threshold constant exceeds 0.5. If the target is smaller that this, prior visual detection will not affect the probability of a subsequent detection in any way.

Once a pilot has observed a target visually, further checks are made to determine if the pilot is able to identify the aircraft type of the target, see the target's afterburner state, see external stores on the target aircraft, and identify these stores.

2.3.1 Functional Element Design Requirements

2.3.2 Functional Element Design Approach

2.3.3 Functional Element Software Design

2.3.4 Assumptions and Limitations

2.3.5 Known Problems or Anomalies